The official voice of the Air Force Research Laboratory
news@afrl
Features
Summer 2000 Volume II, Issue 2

Program is working on future fiber laser

by Barbara Baca, Directed Energy Directorate

KIRTLAND AFB, N.M. — What is the next generation of laser weapons? The Air Force Research Laboratory, here, has a program working on something beyond chemical lasers – and with new technology, should have an answer in the near future, possibly within the next year.

The Laser Integration Technology program, within the laboratory's Directed Energy Directorate, has been concentrating on the fiber laser. "There will be applications where the logistical demands of chemical lasers are hard to meet and we feel that the fiber laser may be the solution," said Maj. Tom Alley, chief of the directorate's Solid-State Laser Branch.

"The advantages of the fiber laser would be an improved beam quality – higher brightness, small size with packaging flexibility, and reduced electrical power requirements when compared with other solid-state lasers," Alley said. "We also expect a cost reduction with the fiber laser. Technology is developing at such a rapid pace that a kilowatt-class fiber now appears feasible."

Fiber lasers, like other solid-state lasers, start with electricity as their power generation source rather than the chemical reactions that fuel chemical lasers. Electricity drives semiconductor lasers that in-turn pump an optical fiber that produces the laser light. Fiber lasers and other solid-state lasers have yet to achieve power levels similar to chemical lasers that are currently being developed as defensive weapons.

The laser branch is working on this program to build and demonstrate a single fiber laser exceeding one kilowatt of continuous power. This power level will be considered remarkable given that current commercial fiber lasers are in the 10-40 watt range.

Last year California-based SDL Inc. demonstrated 110 watts of laser power from a single fiber laser. Soon after, the directorate's program began working with the company under agreements to scale power levels even further.

SDL can trace its early roots to 1983 when they began their work with the Air Force Research Laboratory's predecessors: Weapons Laboratory and Phillips Laboratory. Much of SDL's early business began with Small Business Innovative Research Program contracts under the Air Force Research Laboratory. **@**